

TABLE 1—Serial Cross-Sectional Prevalence of Condom Use in Receptive Anal Sex at Visit 4 (V4) and Visit 5 (V5)

	V4 N (%)	V5 N (%)
No receptive anal sex	375 (52)	341 (53)
Consistent condom use	66 (9)	78 (12)
Inconsistent condom use	96 (13)	94 (15)
Condoms never used	192 (26)	129 (20)
Total	729	642

safer sexual practices increased somewhat over a six-month interval.

A second approach to assess risk reduction takes account of intra-individual stability or instability in behavior and is shown in Table 2. Prevalence of intra-individual change in the V4-V5 cohort was 41 percent, much higher than suggested in Table 1. Among those maintaining the same behavior, a majority maintained safer practices, but 49 percent of those never using condoms maintained such a practice over six months. Intra-individual change to safer sexual practices was reported in 24 percent of the cohort, but this approach revealed relapse to less safe sex in 17 percent of participants.

TABLE 2—Individual Patterns of Maintenance and Change in Safer Sexual Practices in Receptive Anal Sex Over a Six-month Period

Practices at V4	Base at V4 N (%)	Main-tained at V5 N (%)	Changed to less safe N (%)	Changed to safer N (%)
No receptive anal sex	307 (51)	239 (78)	68 (22)	—*
Consistent condom use	56 (9)	24 (43)	13 (23)	19 (34)
Inconsistent condom use	85 (14)	27 (32)	23 (27)	35 (41)
Condoms never used	153 (26)	62 (49)	—*	91 (59)
Total (N = 601)	601	352 (59)	104 (17)	145 (24)

*Such change was not possible at V5, as participants were already at most extreme categories at V4.

Discussion

Intra-individual fluctuations in individual risk-relevant behaviors have been reported in many longitudinal studies of homosexual men.⁶ As early as 1985, a report from San Francisco noted that over the course of one year, approximately half the men observed in one cohort had changed their behavior, from completely or probably safe to probably or definitely risky.⁷ Aggregate measures, as we demonstrated, can underestimate the magnitude of change to safer sexual practices, but even more important, they often fail to convey important information on adoption, maintenance and relapse in individual patterns of behavior over time. They are therefore, an essential part of evaluating long-term behavioral change, whether the change is related to HIV/AIDS or to other conditions.

ACKNOWLEDGMENTS

This work was supported by funding from the National Institute of Mental Health (2R01MH39346 and 1 KO1 MH00507) and the University of Michigan. The authors appreciate the contribution of biomedical data by the Chicago Multicenter AIDS Cohort Study (AI-32535 from the National Institute of Allergy and Infectious Diseases). We are grateful to the Howard Brown Memorial Clinic of Chicago for its continuing assistance in data collection and search. This paper was presented in part at the Vth International Conference on AIDS, Montreal, June 1989.

REFERENCES

- Valdiserri RO, Lyter D, Leviton LC, Callahan CM, Kingsley LA, Rinaldo CR: Variables influencing condom use in a cohort of gay and bisexual men. *Am J Public Health* 1988; 78:801-805.
- Schechter MT, Craib KJP, Willoughby B, et al: Patterns of sexual behavior and condom use in a cohort of homosexual men. *Am J Public Health* 1988; 78:1535-1539.
- Kelly JA, St. Lawrence JS: Risk behavior change in gay men. *Am J Public Health* 1990; 80:351.
- Joseph JG, Montgomery SB, Emmons CA, et al: Magnitude and determinants of behavioral risk reduction: Longitudinal analysis of a cohort at risk for AIDS. *Psychol Health* 1987; 1:73-96.
- Joseph JG, Montgomery SB, Emmons CA, et al: Perceived risk of AIDS: Assessing the behavioral and psychological consequences in a cohort of gay men. *J Appl Soc Psychol* 1987; 17:231-250.
- Becker MH, Joseph JG: AIDS and behavioral change to reduce risk: A review. *Am J Public Health* 1988; 78:394-410.
- Stall R, McKusick L, Wiley JA, Coates TJ, Ostrow DG: Alcohol and drug use during sexual activity and compliance with safe sex guidelines for AIDS: The AIDS Behavioral Research Project. *Health Educ* 1986; 13:359-371.

Seat Belt Use in Cars with Air Bags

ALLAN F. WILLIAMS, PhD, JOANN K. WELLS, BS, AND ADRIAN K. LUND, PhD

Abstract: Seat belt use was observed in 1,628 cars with air bags and manual belts and 34,223 cars with manual seat belts only. Sixty-six percent of drivers in cars with air bags wore seat belts compared to 63 percent of drivers in cars with manual belts only. The study found no evidence for the speculation that drivers with air bags will reduce their seat belt use because they believe an air bag alone provides sufficient protection. (*Am J Public Health* 1990; 80:1514-1516.)

From the Insurance Institute for Highway Safety. Address reprint requests to Allan F. Williams, PhD, Insurance Institute for Highway Safety, 1005 N. Glebe Road, Arlington, VA 22201. This paper, submitted to the *Journal* April 23, 1990, was revised and accepted for publication June 29, 1990.

© 1990 American Journal of Public Health 0090-0036/90\$1.50

Introduction

Federal regulations in the United States require that all passenger cars manufactured in 1990 and after be equipped with automatic restraints. During the phase-in period for this requirement, manufacturers had to equip 10 percent of their passenger cars with automatic restraints in the 1987 model year, 25 percent in 1988, and 40 percent in 1989. Two types of restraint systems have been used to meet the requirement: air bags that inflate automatically in frontal crashes, and seat belts that automatically fasten around occupants when they enter or start the car. When the automatic restraint requirement was being phased in, most manufacturers met it by installing automatic seat belts rather than air bags. Increasingly, air bags have been offered. The percentage of automatic restraint cars sold with air bags was about 10 percent in the 1987 model year and is projected to be 30 percent in

1990 models.¹ Based on announced plans of manufacturers, air bags will be the predominant automatic restraint offered in the 1990s.

Cars with driver side air bags (as well as those few that currently have right front passenger side air bags) are also equipped with manual lap and shoulder belts to meet federal requirements for lateral and rollover crash protection. Together, air bags and lap/shoulder belts provide the most effective restraint protection available. There has been concern that occupants might be less likely to use a manual lap/shoulder belt in vehicles with air bags than in cars that had only manual lap/shoulder belts, because they may erroneously assume that the air bag alone provides full or sufficient crash protection. To the extent that this occurred, it would lessen the crash protection otherwise achievable through the combination of air bags and seat belts. To provide information on this question, a survey of belt use in late model cars with and without air bags was undertaken.

Methods

Seat belt use by drivers and right front seat passengers was observed in four metropolitan areas in the fall of 1989. The areas surveyed were metropolitan Chicago, Los Angeles, Philadelphia, and the Maryland and Virginia suburbs of Washington, DC. In each of these areas, seat belt use is required by state law.

To provide a sample of late model cars, observations were restricted to cars with high center mounted brake lights. These lights have been required on all new cars beginning with the 1986 model year. (Some 1985 cars also had high center mounted brake lights, but these were subsequently eliminated from the study sample.)

In each metropolitan area, observations were made at 64 sites, typically intersections with traffic lights. The sites were distributed throughout the metropolitan regions but were concentrated in affluent areas to maximize the likelihood of observing late model cars. Observations at a site were made during either morning (7:00–9:30 am) or evening (4:00–6:30 pm) rush hours. Sites and observation procedures were the same as those used in a previous survey.²

In addition to observing shoulder belt use, observers recorded license plate numbers of the vehicles, which were used to obtain vehicle identification numbers (VINs) from motor vehicle departments in Illinois, California, Pennsylvania, Maryland, and Virginia. VINs provide information on car model, model year, and type of restraint system. Using this technique, errors in identifying the vehicle observed are possible only in rare instances, such as the license number was recorded incorrectly or the owner had transferred the license plate from another car to the one observed and the department of motor vehicles had not yet updated their files.

Results

Seat belt use was observed in 45,466 1986–90 model year cars; complete VIN information was available for 97 percent of these vehicles. Of these 44,102 cars, 1,628 were equipped with air bags and lap/shoulder manual belts; 34,223 were equipped with manual lap/shoulder belt systems only. Driver belt use rates were about the same in cars with and without air bags (Table 1). Overall, 66 percent of drivers in cars with air bags used seat belts compared to 63 percent of drivers in cars with manual belts only. Belt use rates of drivers with and without air bags were about the same in each metropolitan area, although belt use rates were substantially higher in Los

TABLE 1—Driver Manual Belt Use in Cars with Air Bags and in Cars with Manual Belts Only, by Metropolitan Area

Metropolitan Area	Percent (N) Using Belts	
	Air Bag Cars	Manual Belt Cars
Chicago	51 (355)	53 (10441)
Los Angeles	73 (684)	71 (8540)
Philadelphia	59 (317)	57 (8521)
Washington, DC	75 (272)	76 (6721)
Total	66 (1628)	63 (34223)

Angeles and the Washington, DC area than in Chicago and Philadelphia.

Only a few of the observed cars had a right front passenger air bag and a right front passenger present (N = 22); 50 percent of these passengers were belted. For right front passengers in cars with driver side air bags only, belt use was 56 percent (N = 235) compared to 54 percent (N = 5473) in cars without air bags. Belt use rates for drivers in cars that had right front passengers present was 64 percent in cars with driver side air bags only and 59 percent in cars without air bags.

Table 2 presents driver belt use in cars with and without air bags by manufacturer. Driver belt use was as high or higher in air bag equipped cars as in cars without air bags except for the Chrysler models, which had a slightly lower use rate.

Table 3 presents driver belt use in cars with and without air bags for specific models of cars that were observed in sufficient numbers to make such comparisons. These data indicate that belt use was usually about the same or slightly higher in cars with air bags.

Cars with air bags in the study sample were on average newer than cars with manual belts only. Table 4 presents data on cars with and without air bags by model year. Belt use increased slightly by model year both for cars with and without air bags. For each model year, driver belt use was as high or higher in air bag cars as in cars without air bags.

Discussion

There is no evidence from this survey that the presence of an air bag lessens the likelihood of using a seat belt. Manual seat belt use by drivers of cars with driver side air bags was about the same as for drivers of late model cars that did not have air bags. In cars with drivers and right front passengers

TABLE 2—Driver Manual Belt Use in Cars with Air Bags and in Cars with Manual Belts Only, by Manufacturer

Manufacturer*	Percent (N) Using Belts	
	Air Bag Cars	Manual Belt Cars
BMW	75 (101)	62 (587)
Chrysler	54 (243)	59 (2852)
Ford	64 (157)	59 (5624)
Honda	73 (166)	73 (4186)
Mercedes	64 (772)	—
Volvo	81 (142)	78 (624)
Total	66	64
Total (excluding Mercedes)	67	64

*Forty-seven air bag cars of low volume manufacturers (driver belt use 68 percent) not included.

TABLE 3—Driver Manual Belt Use in Cars with Air Bags and In Cars with Manual Belts Only, by Make/Series

Make/Series	Percent (N) Using Belts	
	Air Bag Cars	Manual Belt Cars
BMW 5,6,7 Series; M6	76 (96)	75 (88)
Chrysler LeBaron Sedan, Convertible	53 (103)	50 (142)
Chrysler LeBaron Coupe	60 (57)	48 (31)
Dodge Daytona	47 (66)	41 (39)
Ford Tempo	57 (46)	59 (282)
Lincoln Continental	68 (90)	66 (77)
Acura Legend	73 (166)	71 (348)
Volvo 740, 760	82 (133)	81 (325)

present, driver belt use was eight percentage points higher than passenger belt use in cars with driver side air bags and five percentage points higher in cars with manual belts only. If air bags reduced belt use, driver belt use in these air bag equipped cars would have been much lower relative to passenger use.

Manual belt use rates were higher than average in this survey because the observations were restricted to late model cars and were concentrated in affluent areas in states with laws requiring belt use. All of these factors elevate seat belt use.^{3,4} Most of the nation's population (89 percent) is now covered by belt use laws; belt use rates in cars with and without air bags would be expected to be lower in the 14 remaining states without laws. Nevertheless, many drivers and right front

TABLE 4—Driver Manual Belt Use in Cars with Air Bags and in Cars with Manual Belts Only, by Model Year

Model Year	Percent (N) Using Belts	
	Air Bag Cars	Manual Belt Cars
1986	63 (185)	63 (9781)
1987	65 (319)	63 (9696)
1988	67 (434)	62 (8673)
1989	66 (630)	64 (5994)
1990	67 (60)	66 (79)

passengers observed were not using seat belts even though required by law to do so. An important goal is to increase seat belt use both in cars with and without air bags.

ACKNOWLEDGMENTS

This work was supported by the Insurance Institute for Highway Safety. The assistance of Michael A. Ciccone is gratefully acknowledged.

REFERENCES

1. US Dept of Transportation: Evaluation Plan; Federal Motor Vehicle Safety Standards; Passenger Car Front Seat Occupant Protection. Federal Register 1990; 55:1586-1591.
2. Williams AF, Wells JD, Lund AK, Teed N: Observed use of automatic seat belts in 1987 cars. *Accident Anal Prev* 1989; 21:427-433.
3. National Highway Traffic Safety Administration: Restraint System Usage in the Traffic Population, 1988 Annual Report. (DOT HS 807 447). Washington, DC: US Department of Transportation, 1989.
4. Lund AK: Voluntary seat belt use among US drivers: Geographic, socioeconomic and demographic variation. *Accident Anal Prev* 1986; 18:43-50.

Age, Sex, and Road-Use Patterns of Motor Vehicular Trauma in Rhode Island: A Population-Based Hospital Emergency Department Study

IAN R.H. ROCKETT, PhD, MPH, ELLICE S. LIEBERMAN, MD, DrPH, WILLIAM H. HOLLINSHEAD, MD, MPH, SANDRA L. PUTNAM, PhD, AND HENRY C. THODE, PhD

Abstract: Population-based hospital emergency department data on motor vehicle traffic trauma in Rhode Island, 1984-85, are analyzed by age, sex, and road-use status. Annualized rates of overall and severe trauma were 1,195 cases (95% confidence interval [CI] = 1,164, 1,225) and 102 cases (95% CI = 94, 111) per 100,000 population, respectively. Overall and severe rates peaked at ages 15-24 years. Male rate excesses were most pronounced for motor-cycle and pedal cycle trauma. (*Am J Public Health* 1990; 80:1516-1518.)

From the Department of Health, Leisure, and Safety, and the Health Services Research Center, University of Tennessee, Knoxville; Department of Maternal and Child Health, Harvard School of Public Health, and Department of Obstetrics and Gynecology, Brigham and Women's Hospital, Boston; Division of Family Health, Rhode Island Department of Health; and the Injury Prevention and Analysis Group, Brookhaven National Laboratory. Address reprint requests to Ian R.H. Rockett, PhD, MPH, Department of Health, Leisure, and Safety, University of Tennessee, 1914 Andy Holt Avenue, Knoxville, TN 37996-2700. This paper, submitted to the *Journal* October 13, 1989, was revised and accepted for publication May 17, 1990.

© 1990 American Journal of Public Health 0090-0036/90\$1.50

Introduction

Population-based data on nonfatal motor vehicular trauma are not collected routinely. In population-based studies, case selection has typically been restricted in terms of injury diagnoses, road-use status, and age of population.¹⁻⁵ An exception is the Northeastern Ohio Trauma Study, in which a comprehensive sample of motor vehicular trauma cases was drawn from regionwide hospital emergency department records.⁶ Adopting a similar methodology, the Rhode Island Department of Health instituted a motor vehicular trauma surveillance system.⁷ This report documents patterns of motor vehicle traffic trauma rates for Rhode Island by age, sex, and road-use status.

Methods

Cases represent a 25 percent systematic sample of first encounter motor vehicle traffic trauma patients treated during 1984 and 1985 in the emergency departments of the 12 Rhode Island civilian, acute care, nonpsychiatric hospitals with an emergency facility. They include only Rhode Island patients and fatalities (on RI roads) with known age and sex, who were or could be assigned an ICD-9CM external cause of injury